

LIDAR EXAMINATION OF MEANDER MIGRATION IN THE MOHAWK RIVER WATERSHED

Ashraf Ghaly, Ph.D., P.E.

Department of Engineering, Union College, Schenectady, NY 12308

Meander migration is a phenomenon observed along curved segments of waterways. Erosion and sedimentation occur at opposite sides of the waterway at bending sections. The rate of erosion and sedimentation is dependent on many parameters including the type of soil, bend geometry, and flow velocity. The flow pattern includes velocity along the path of the waterway as well as that of the helical flow sweeping dense eroded materials that aggravate and accelerate the processes of erosion and sedimentation. The Mohawk River and two major tributaries in its watershed (Schoharie Creek and West Canada Creek) display significant number of meanders with various geometrical formations. Meander migration is exacerbated with higher flow velocity, softer soil, and sharper bends. The problem of soil scour can be costly to infrastructure facilities in the zone subjected to erosion as it results in the destabilization of supporting foundations. It can also impact developed communities as the banks of the river shift adding area to one side and subtracting area from the other. This paper uses high-resolution LiDAR images to detect the pattern of meander migration at certain sections along the Mohawk River. It shows the density of the suspended transport in the flow at meander sections. An analysis of the LiDAR images will also show the relative clarity of the water in straight sections of the river when compared with that in meander sections. Soil protection or river banks at meander sections will also be discussed including facilities such as bulkheads, retaining walls, gabions, sheet piles, and geosynthetic.

Oral Presentation